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YODICHKAS, ANEETA				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/528,065

Applicant(s)

GIDON, SERGE

Examiner

Aneeta Yodichkas

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. **Claims 20-22, 24-27, and 30-30 and 38** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,835,477 to *Binning et al.* in view of U.S. Patent No. 6,084,849 to *Durig et al.*

As to **claim 20**, *Binning* discloses the data recording device comprising a two-dimensional array of microtips (14; Figs. 1, 2) attached directly to a fixed base (13.1-13.4 fixed to 20), arranged in a plane opposite a storage medium (Fig. 5A, columns 8-9, lines 66-1), where the parallel probes (46) are the microtips and they are formed in an array, and electronic means for addressing and controlling the microtips so as to enable data recording on the storage medium (Fig. 8, column 11, lines 12-15), where the memory controls addressing and controlling of the microtips, a plurality of cells diaphragms (11.1-11.4) borne by a frame (framed by 10) delimiting the cells (Fig. 2), at least one micro-tip being associated with each cell (Figs. 2, 3, column 8, lines 36-38, Fig. 5A, columns 8-9, lines 66-1), where each storage field (31) is a cell and each tip (46) is associated with each cell.

Binning is deficient in disclosing the storage medium comprising a "flexible" diaphragm borne by the frame.

However, *Durig* discloses the storage medium comprising a flexible diaphragm borne by a frame (Figs. 6, 7, column 4, lines 25-31, column 6, lines 7-12), where the SMA layer (24) is flexible and cells (54.1-54.4) have microtips (52.1-52.4) associated with each one of them).

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to have modified the data recording device comprising a two-dimensional array of microtips as taught by *Binning* by including that the storage medium comprises a flexible diaphragm as taught by *Durig*. The suggestion/motivation would have been in order for the recording medium to be able to change shape several times without the recording medium changing its properties (*Durig*, column 3, lines 24-36).

As to **claim 21**, *Binning* discloses the device, wherein the microtips have an apex of nanometric dimensions (Column 9, lines 8-12), where if the distance between tip to tip is in the nm range, so is the apex.

As to **claim 22**, *Binning* discloses the device, wherein the cells (31) are rectangular (Fig. 3, column 8, lines 36-38), where each storage field, or cell (31) is rectangular.

As to **claim 24**, *Binning* discloses the device, comparing two arrays of the microtips arranged on each side of the storage medium (Fig. 5A, column 8, lines 62-66), where multiple arrays of microtips are shown.

As to **claim 25**, *Binning* discloses the device, wherein the two arrays of microtips are laterally offset so that the microtips associated with any one cell of the frame are not

arranged exactly opposite one another (Fig. 5A-B, columns 8-9, lines 62-4), where the microtips are offset laterally.

As to **claim 26**, *Binning* discloses the device, wherein the frame is formed by a silicon layer in which cells are formed (Column 5, lines 1-3), where the media is made of silicon.

As to **claim 27**, *Binning* is deficient in disclosing the device, wherein the flexible diaphragm comprises at least a first layer, performing the function of a memory, and a second layer designed to ensure a certain rigidity.

However, *Durig* discloses the device, wherein the flexible diaphragm comprises at least a first layer, performing the function of a memory, and a second layer designed to ensure a certain rigidity (Fig. 2, column 4, lines 5-9), where the first layer is an SMA layer, or flexible memory layer (24) and the second layer is rigid (20). In addition, the same motivation is used as the rejection in claim 20.

As to **claim 30**, *Binning* is deficient in disclosing the device, wherein the flexible diaphragm comprises first and second elementary diaphragms separated by an array of spacer elements laterally offset with respect to the frame.

However, *Durig* discloses the device, wherein the flexible diaphragm comprises first and second elementary diaphragms separated by an array of spacer elements laterally offset with respect to the frame (Fig. 6, columns 5-6, lines 66-4), where fields (54.1-54.4) are separate diaphragms and they are spaced apart laterally.

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to have modified the data recording device comprising a two-

dimensional array of microtips as taught by *Binning* by including flexible diaphragms separated by spacer elements as taught by *Durig*. The suggestion/motivation would have been in order to access data on the storage medium at a faster rate (*Durig*, Fig. 6 and 7, columns 5-6, lines 66-25).

As to **claim 31**, *Binning* is deficient in disclosing the device, wherein the array of spacer elements constitutes an intermediate frame.

However, *Durig* discloses the device, wherein the array of spacer elements constitutes an intermediate frame (Fig. 6, columns 5-6, lines 66-4), where spacer elements (54.1-54.4) are spaced apart. In addition, the same motivation is used as the rejection in claim 30.

As to **claim 32**, *Binning* is deficient in disclosing the device, wherein the spacer elements are formed by studs.

However, *Durig* discloses the device, wherein the spacer elements are formed by studs (Fig. 7, column 6, lines 4-12), where the storage fields (54.1-54.4) are the spacer elements are formed by the cantilevers and tips. In addition, the same motivation is used as the rejection in claim 30.

As to **claim 33**, *Binning* discloses sub-diving each cell into a plurality of elementary cells each associated with at least one microtip (Fig. 8, column 12, lines 20-24), where each cell or sub-array (81) is divided into several storage fields (82).

Binning is deficient in disclosing the device, comprising an array of flexible plates, separated from the diaphragms by a two-dimensional array of spacer studs.

However, *Durig* discloses the device, comprising an array of flexible plates, separated from the diaphragms by a two-dimensional array of spacer studs (Fig. 6 and 7, columns 5-6, lines 66-12), where the array of flexible plates are (54.1-54.4) and are spaced by spacer studs, or cantilevers and microtips. In addition, the same motivation is used as the rejection in claim 30.

As to **claim 34**, *Binning* discloses the device, wherein the number of microtips of the array being about ten thousand (Fig. 5A, columns 8-9, lines 62-12), where there are several microtips, the number of the elementary cells subdividing a cell is about one hundred (Fig. 8, column 12, lines 20-24), where each cell or sub-array (81) is divided into several storage fields (82) and the storage fields are great in number.

As to **claim 35**, *Binning* discloses the device, wherein the array of microtips has a slightly different pitch from that of the array of spacer studs (Fig. 5A, column 8, lines 62-65), where the microtips are probes (46) and the studs are levelers (47) and because the tips of the probes or microtips are sharper, the spacing between them tip to tip is greater than the space between the studs, or levelers.

As to **claim 36**, *Binning* is deficient in disclosing the device, wherein the frame and plates are formed in a silicon layer having a thickness of 100 μ m to 500 μ m.

However, *Durig* discloses the device, wherein the frame and plates are formed in a silicon layer having a thickness of 100 μ m to 500 μ m (Fig. 2, column 4, lines 9-12), where substrate (20) is the silicon layer and it has a thickness of a few hundred microns.

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to have modified the data recording device comprising a two-dimensional array of microtips as taught by *Binning* by including that there is a silicon layer on the disc having a thickness of 100 μ m to 500 μ m as taught by *Durig*. The suggestion/motivation would have been in order for the substrate to be thick enough to carry the load of the pressure from the memory layer SMA when it is indented (*Durig*, column 4, lines 5-16).

As to **claim 38**, *Binning* discloses the device, comprising means for relative movement of the storage medium and the microtip array, in a direction parallel to said plane (Fig. 5A, column 9, lines 7-12), where the microtip array (46) is moved in a direction parallel to the plane by reading/writing to the first column, then moving to the second column, etc.

2. **Claim 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,835,477 to *Binning et al.* in view of U.S. Patent No. 6,084,849 to *Durig et al.* as applied to claim 20 above, and further in view of U.S. Patent No. 3,646,533 to *Rosenblum*.

As to **claim 23**, *Binning* and *Durig* are deficient in disclosing the device, wherein the cells are hexagonal.

However, *Rosenblum* discloses the device, wherein the cells are hexagonal (Fig. 2A, column 2, lines 12-14), where the honeycomb core is the hexagonal cells used for storing information.

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to have modified the cells on the disc as taught by *Binning* and *Durig* by including that the cells are hexagonal as taught by *Rosenblum*. The suggestion/motivation would have been in order to form a low density core (Rosenblum, column 2, lines 42-44).

3. **Claims 28 and 29** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,835,477 to *Binning et al.* in view of U.S. Patent No. 6,084,849 to *Durig et al.* as applied to claim 20 above, and further in view of U.S. Patent No. 6,579,742 B2 to *Chen*.

As to **claim 28**, *Binning* and *Durig* are deficient in disclosing the device, wherein the second layer is an amorphous carbon or diamond-like carbon layer deposited on a silicon layer before formation of the cells is performed on the opposite face of the silicon layer.

However, *Chen* discloses the device, wherein the second layer is an amorphous carbon or diamond-like carbon layer deposited on a silicon layer before formation of the cells is performed on the opposite face of the silicon layer (Fig. 1a-c, columns 4-5, lines 65-7), where layer (22) can comprise of a diamond-like carbon.

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to have modified the data recording device comprising a two-dimensional array of microtips as taught by *Binning* and *Durig* by including that the second layer is a diamond-like carbon layer as taught by *Chen*. The

suggestion/motivation would have been in order for the substrate to be electrically insulating (Chen, columns 4-5, lines 65-7).

As to **claim 29**, *Durig* further discloses the device, wherein the second layer is doped by boron or silver (Fig. 3C, column 5, lines 28-31), where second layer (20) is conductive and can become conductive by doping boron or silver into it.

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to have modified the data recording device comprising a two-dimensional array of microtips as taught by *Binning* by including that the second layer of the recording medium is doped by boron or silver as taught by *Durig*. The suggestion/motivation would have been in order for the substrate to serve as a back-electrode (*Durig*, column 5, lines 28-31).

4. **Claim 37** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,835,477 to *Binning et al.* in combination with U.S. Patent No. 6,084,849 to *Durig et al.* and further in view of U.S. Patent No. 4,451,914 to *LaBudde et al.*

The combination of Binning et al. and Durig is deficient in disclosing a device, wherein the spacer elements or studs are made of silicon dioxide, silicon nitride, or carbon, with a thickness of 50 nm to 500 nm.

However, *LaBudde* discloses a device, wherein the spacer elements or studs are made of silicon dioxide, silicon nitride, or carbon, with a thickness of 50 nm to 500 nm (Fig. 6, column 6, lines 61-67), where spacer layer (96) is made of silicon dioxide and is 500-1200 angstroms thick.

At the time of invention, it would have been obvious to a person of ordinary skilled in the art to have modified the data recording device as taught by *Durig* by including a spacer as taught by *LaBudde*. The suggestion/motivation would have been in order to provide improved optical recording and reproducing sensitivity (LaBudde, column 2, lines 40-45).

Response to Arguments

5. Applicant's arguments filed 4/16/09 have been fully considered but they are not persuasive.

First, Applicant argues with respect to claim 20, on page 6, lines 17-24, that *Binning* and *Durig* fail to disclose, "data recording device comprising two-dimensional array of microtips attached directly to a fixed base".

Examiner disagrees as *Binning* and *Durig* both discloses, "data recording device comprising two-dimensional array of microtips", for instance *Binning* discloses that microtips 14; Figs. 1, 2 are attached directly to a fixed base 13.1-13.4 fixed to 20. Furthermore, *Durig* discloses Fig. 7, column 6, lines 4-8, where cantilevers (52.1-52.4) are a two-dimensional array and each cantilever has a microtip, and *Durig* discloses, a microtip attached directly to a fixed base cantilevers (52.1-52.4) fixed to (51).

Second, Applicant argues with respect to claim 20, on page 7, lines 1-9, that *Durig* fails to disclose a storage medium comprising a flexible diaphragm borne by a frame.

Examiner disagrees as *Durig* discloses a storage medium comprising a flexible diaphragm borne by a frame (Fig. 6 and 7, columns 5-6, lines 66-12), where the flexible diaphragm are storage fields (54.1-54.4) and the frame is common substrate (50), where the SMA material layer (24) is flexible.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aneeta Yodichkas whose telephone number is (571) 272-9773. The examiner can normally be reached on Monday-Thursday 8-5, alternating Fridays, 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea Wellington can be reached on (571) 272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jorge L Ortiz-Criado/
Primary Examiner, Art Unit 2627

/A.Y./
6/16/09